

# Tactile Switch

## B3F

### Miniature, Space-Saving Tactile Switch Provides Long Service Life and Easy Mounting

- Extended mechanical/electrical service life:  $10 \times 10^6$  operations for 12 x 12 mm type and  $1 \times 10^6$  operations for the 6 x 6 mm type
- Ideal for applications such as audio, office and communications equipment, measuring instruments, TVs, VCRs, etc.
- Taped radial type, vertical type and high force types are available as series versions
- Flux-tight base structure allows automatic soldering of the tactile switches onto a PC board
- Gold plated models available for increased contact reliability, resistance to corrosive gas and insulation fault prevention for ion migration in harsh environments
- RoHS Compliant



### Ordering Information

#### ■ B3F-1□□□, B3F-3□□□

##### 6 x 6 mm type

Type	Plunger	Switch height x pitch	Operating force	Model			
				Without ground terminal		With ground terminal	
				Bags	Sticks*	Bags	Sticks*
Standard	Flat	4.3 x 6.5 mm	General-purpose: 100 g	B3F-1000	B3F-1000S	B3F-1100	B3F-1100S
			150 g	B3F-1002	B3F-1002S	B3F-1102	B3F-1102S
		5.0 x 6.5 mm	High-force: 260 g	B3F-1005	B3F-1005S	B3F-1105	B3F-1105S
			General-purpose: 100 g	B3F-1020	B3F-1020S	B3F-1120	B3F-1120S
	Projected	5.0 x 6.5 mm	150 g	B3F-1022	B3F-1022S	B3F-1122	B3F-1122S
			High-force: 260 g	B3F-1025	B3F-1025S	B3F-1125	B3F-1125S
		7.3 x 6.5 mm	General-purpose: 100 g	—	—	B3F-1110	—
			150 g	—	—	—	—
Vertical	Flat	3.15 mm	General-purpose: 100 g	B3F-1050	B3F-1050S	B3F-1150	B3F-1150S
			150 g	B3F-1052	B3F-1052S	B3F-1152	B3F-1152S
		3.85 mm	High-force: 260 g	B3F-1055	B3F-1055S	B3F-1155	B3F-1155S
			General-purpose: 100 g	—	—	—	—
	Projected	6.15 mm	150 g	—	—	—	—
			High-force: 260 g	—	—	B3F-3125	—
		6.15 mm	General-purpose: 100 g	—	—	B3F-3150	—
			150 g	—	—	B3F-3152	—
			High-force: 260 g	—	—	B3F-3155	—

\* Number of switches per stick:

Without ground terminal ..... 90/stick  
With ground terminal ..... 75/stick

**Important Note: Switches cannot be water-washed.**

## ■ B3F-1□□□-G

## 6 x 6 mm type with Gold Plating

Type	Plunger	Switch height x pitch	Form of shipment operating force	Model	
				Without ground terminal	With ground terminal
				Bags (100 Switches)	
6 x 6 mm switches with gold plating	Flat	4.3 x 6.5 mm	176 g	B3F-1002-G	B3F-1102-G
		5.0 x 6.5 mm		B3F-1022-G	B3F-1122-G

Note: The minimum order is 100 Switches. Order in multiples of the minimum order.

## ■ B3F-4□□□, B3F-5□□□

## 12 x 12 mm type

Type	Plunger	Switch height x pitch	Operating force	Model				
				Without ground terminal		With ground terminal		
				Bags	Sticks*	Bags	Sticks*	
Standard	Flat	4.3 x 12.5 mm	General-purpose: 130 g	B3F-4000	B3F-4000S	B3F-4100	B3F-4100S	
			High-force: 260 g	B3F-4005	B3F-4005S	B3F-4105	B3F-4105S	
	Projected	7.3 x 12.5 mm	General-purpose: 130 g	B3F-4050	B3F-4050S	B3F-4150	B3F-4150S	
			High-force: 260 g	B3F-4055	B3F-4055S	B3F-4155	B3F-4155S	
Long service life	Flat	4.3 x 12.5 mm	General-purpose: 130 g	B3F-5000	B3F-5000S	B3F-5100	B3F-5100S	
				B3F-5050	B3F-5050S	B3F-5150	B3F-5150S	
	Projected	7.3 x 12.5 mm		B3F-5001	B3F-5001S	B3F-5101	B3F-5101S	
				B3F-5051	B3F-5051S	B3F-5151	B3F-5151S	
High reliability gold-plated contact	Flat	4.3 x 12.5 mm						
	Projected	7.3 x 12.5 mm						

\* Number of switches per stick:  
Without ground terminal ..... 45/stick  
With ground terminal ..... 40/stick

Important Note: Switches cannot be water-washed.

## ■ B3F-6□□□

### Taped Radial (Auto Insertion) 6 x 6 mm type

Type	Plunger	Switch height x pitch	Operating force	Model		
				Without ground terminal	With ground terminal	
B3F-6000	Flat	4.3 x 6.5 mm	General-purpose: 100 g	<b>B3F-6000</b>	<b>B3F-6100</b>	
			High-force: 150 g	<b>B3F-6002</b>	<b>B3F-6102</b>	
		5.0 x 6.5 mm	General-purpose: 100 g	<b>B3F-6020</b>	<b>B3F-6120</b>	
		7.3 x 6.5 mm	High-force: 150 g	<b>B3F-6022</b>	<b>B3F-6122</b>	
	Projected		General-purpose: 100 g	<b>B3F-6050</b>	<b>B3F-6150</b>	
			High-force: 150 g	<b>B3F-6052</b>	<b>B3F-6152</b>	

**Note:** The above switches must be ordered in units of 1,000.

**Important Note:** **Switches cannot be water-washed.**

## ■ Accessories

See "B32" Tactile Switch Key Top data sheet for keycaps that fit projected plunger B3F models.

## ■ Plunger Identification Table

Use this table to determine tactile switch type by plunger color.

Plunger color	Operating force	Type
Light gray	100 g	B3F-1000, 1150, 3100, 6000, 6050
White	100 g	B3F-1050, 1100, 3150, 4000, 4050, 4100
Black	100 g	B3F-1020, 1110, 1120, 3120, 6020, 6120
Blue	130 g	B3F-5000 Series
Yellow	150 g	B3F-1002, 1052, 1102, 3102, 3152, 4005, 4055, 4105, 4155, 6002, 6052
Medium gray	150 g	B3F-1022, 1122, 3122, 6022
Orange	260 g	B3F-1005, 1055, 1105, 3105, 6005, 6055
Pink	260 g	B3F-1025, 1125, 3125, 6025

# Specifications

## ■ Characteristics

	Part Number				
	B3F-1□□□	B3F-4□□□	B3F-5□□□	B3F-6□□□	B3F-1□□□-G
<b>Service life (see note 1) [mechanical/electrical]</b>	1,000,000 operations minimum	3,000,000 operations minimum	10,000,000 operations minimum	1,000,000 (300,000) operations min.	300,000 operations min.
<b>Weight (see note 2)</b>	Approx. 0.25 g	Approx. 0.85 g		Approx. 0.25 g	
<b>Contact form</b>	SPST-NO				SPST-NO
<b>Switching capacity</b>	1 to 50 mA, 5 to 24 VDC (resistive load)				100 $\mu$ A to 50 mA, 5 to 24 VDC (resistive load)
<b>Contact resistance</b>	100 M $\Omega$ max.				100 M $\Omega$ max. (initial value) (rated: 100 $\mu$ A, 5 VDC)
<b>Insulation resistance</b>	100 M $\Omega$ min. (at 250 VDC)				
<b>Dielectric strength</b>	500 VAC, 50/60 Hz for 1 minute				
<b>Bounce time</b>	5 ms max.				
<b>Vibration</b>	Malfunction durability: 10 to 55 Hz, 1.5 mm double amplitude				Malfunction: 10 to 55 Hz, 1.5 mm double amplitude for 30 to 60 s
<b>Shock</b>	Mechanical durability: 1,000 m/s <sup>2</sup> (approx. 100 G) Malfunction durability: 100 m/s <sup>2</sup> (approx. 10 G)				Destruction: 1,000 m/s <sup>2</sup> max.
<b>Ambient temperature</b>	-25° to 70°C (with no icing)				
<b>Humidity</b>	35% to 85% RH				35% to 85%

**Note:** 1. Figure in parentheses denotes the service life of high force type.

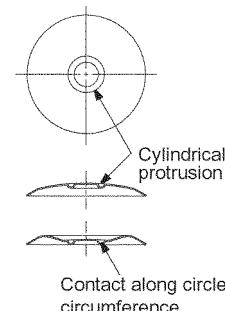
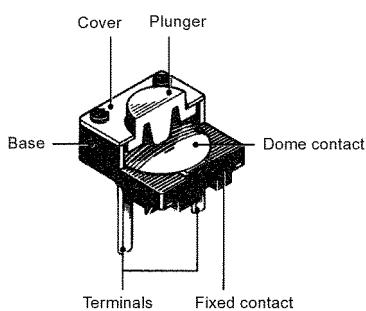
2. Denotes the weight of standard type.
3. Data shown are of initial value.

## ■ Operating Characteristics

Characteristics	Part Number						
	B3F-1□□□ / -3□□□		B3F-4□□□ / -5□□□		B3F-6□□□		B3F-1□□□-G
	General purpose type	High force type	General purpose type	High force type	General purpose type	High force type	General purpose type
<b>Operating force (OF)</b>	100 $\pm$ 30 g	150 $\pm$ 50 g	130 $\pm$ 50 g	260 $\pm$ 70 g	100 $\pm$ 30 g	150 $\pm$ 50 g	1.76 $\pm$ 0.49 N
<b>Release force (RF) min.</b>	20 g	50 g	30 g	50 g	20 g	50 g	0.49 N
<b>Pretravel (PT) max.</b>	0.25 $^{+0.2}_{-0.1}$ mm	0.25 $^{+0.2}_{-0.1}$ mm	0.3 $^{+0.2}_{-0.1}$ mm	0.3 $^{+0.2}_{-0.1}$ mm	0.25 $^{+0.2}_{-0.1}$ mm	0.25 $^{+0.2}_{-0.1}$ mm	0.25 $^{+0.2}_{-0.1}$ mm

## ■ Construction

**B3F-1□□□-G**

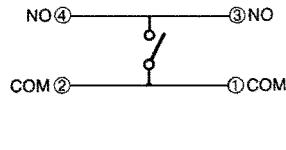


Contact along circle circumference  
(circular contact)

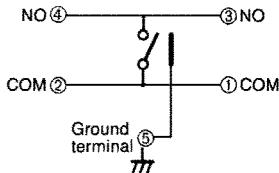
Switches have circular contact surface instead of single center point contact, increasing contact reliability.

## ■ Contact Form

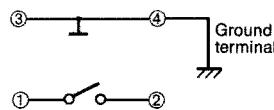
B3F-10□□  
-40□□  
-50□□  
-10□□-G



B3F-11□□  
-41□□  
-51□□  
-11□□-G



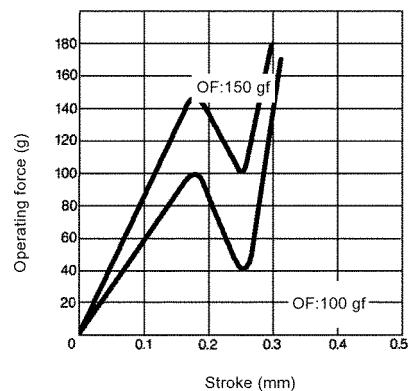
B3F-3□□□



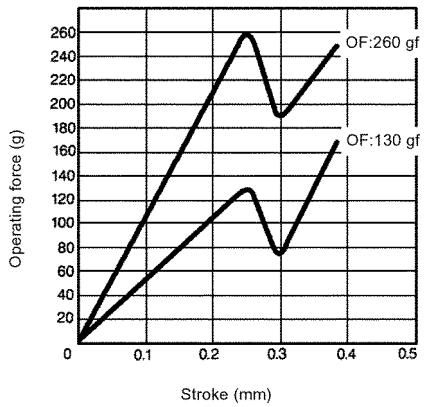
## Engineering Data

### ■ Operating Force vs. Stroke (typical example)

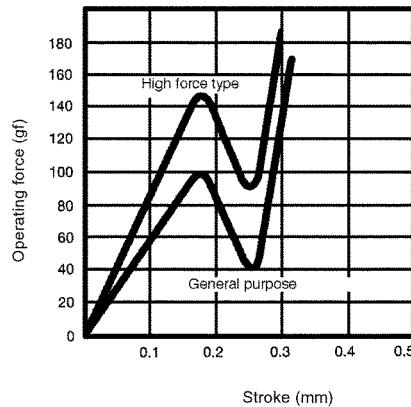
B3F-1□□□□/-3□□□



B3F-4□□□□/-5□□□



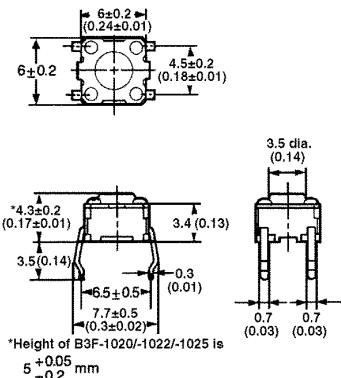
B3F-6□□□



# Dimensions

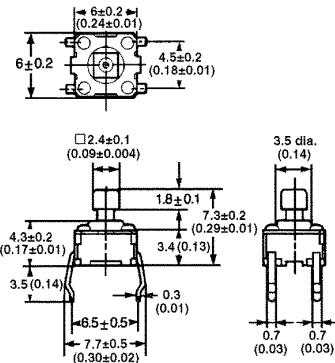
Unit: mm (inch)

## ■ B3F-1000/-1002/-1005/-1020\*/-1022\*/-1025\*

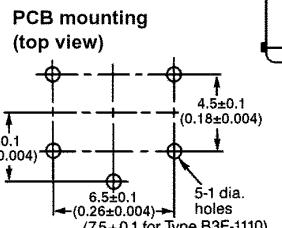
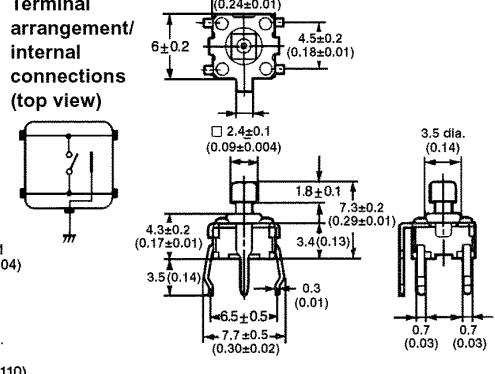
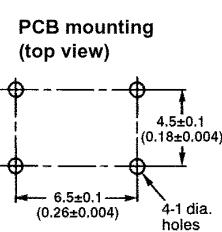
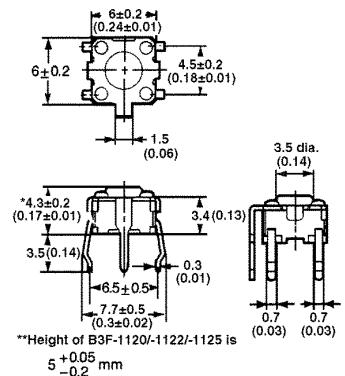


The height of the B3F-1022-G is 5±0.2 mm.

## ■ B3F-1050/-1052/-1055



## ■ B3F-1100/-1102/-1105/-1120\*\*/-1122\*\*/-1125\*\*

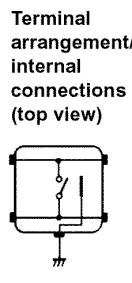
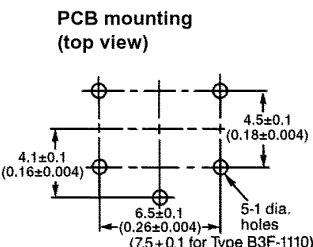
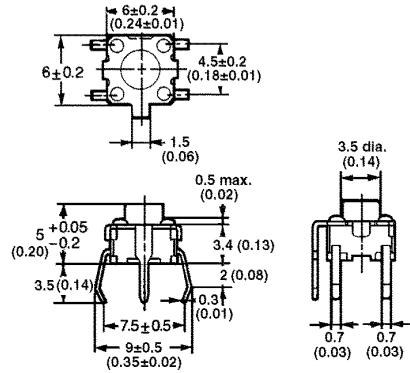


The height of the B3F-1122-G is 5±0.2 mm.

**Note:** Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals on the left side are numbered "2" and "4" respectively.

**Note:** Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

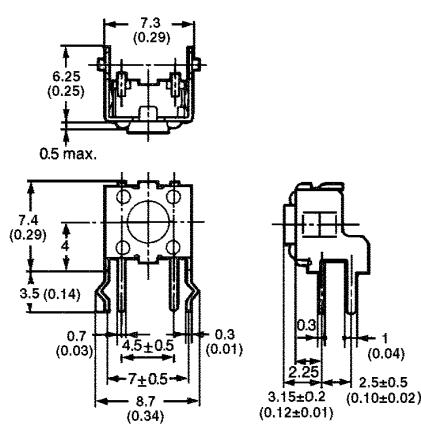
## ■ B3F-1110



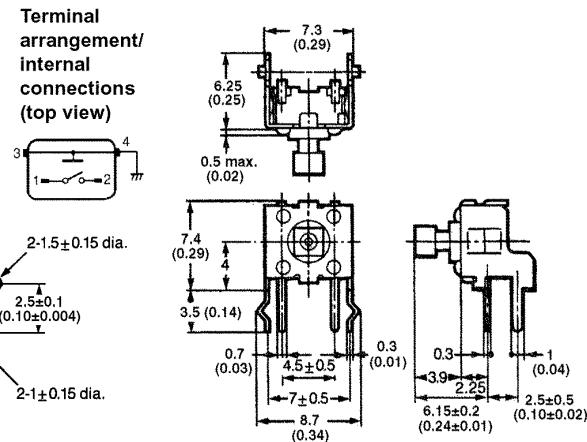
**Note:** Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals on the left side are numbered "2" and "4" respectively.

Unit: mm (inch)

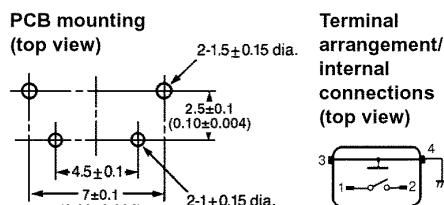
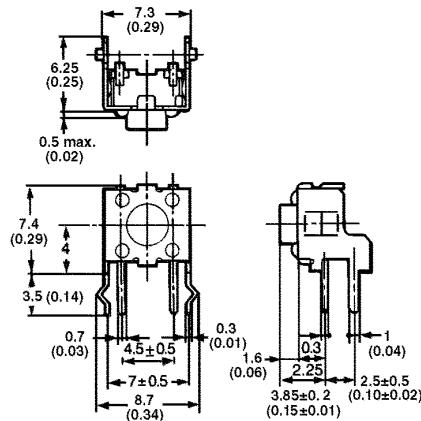
## ■ B3F-3100/-3102/-3105



## ■ B3F-3150/-3152/-3155

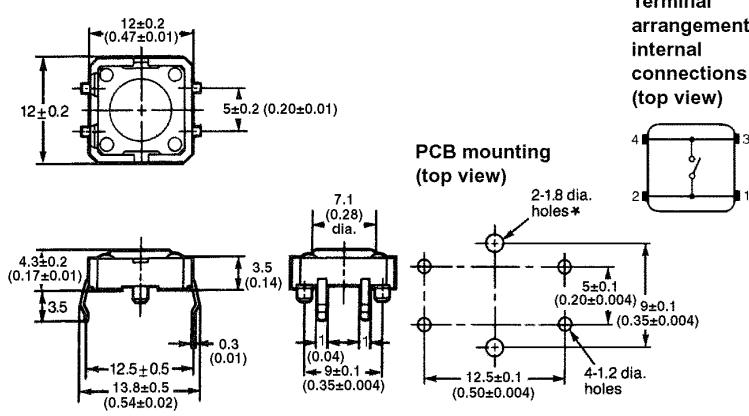


## ■ B3F-3120/-3122/-3125

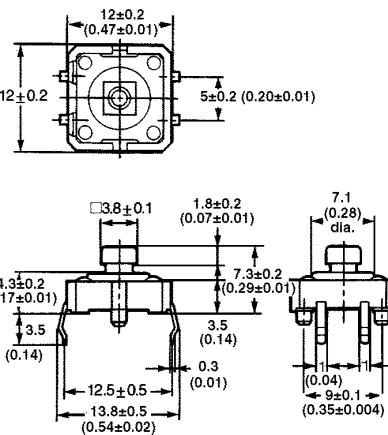


**Note:** Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## ■ B3F-4000/-5000/-4005/-5001

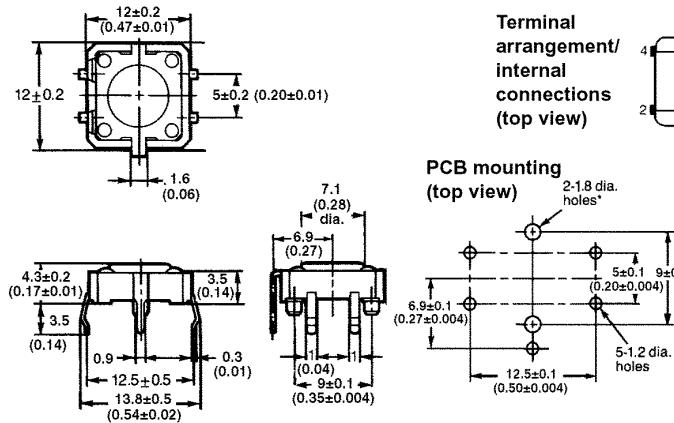


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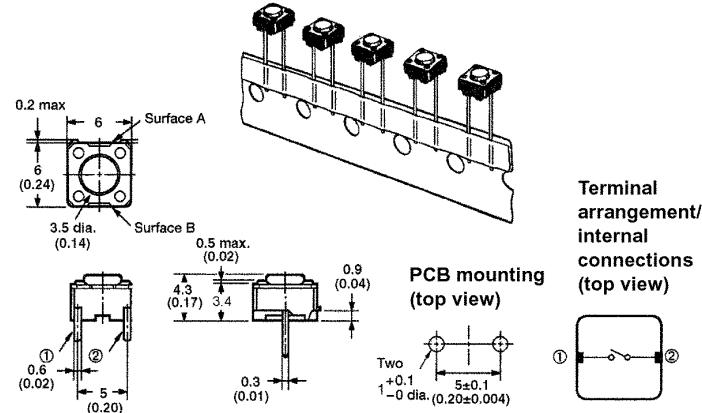
\* Fit the projection of the switch into this hole to secure the switch.

■ B3F-4101/-5100/-4105/-5101



\* Fit the projection of the switch into this hole to secure the switch.

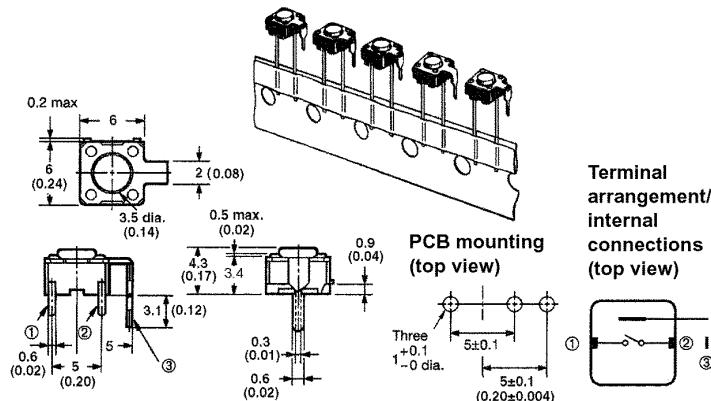
## ■ B3F-6000/-6002



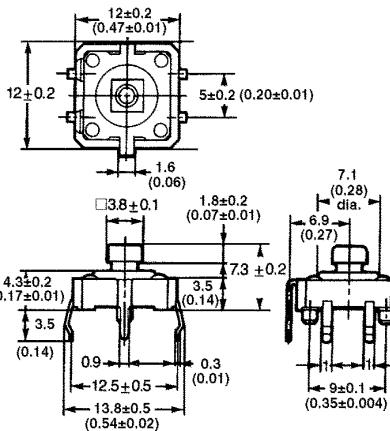
**Note:** The tape is random between surface A and surface B.

Unit: mm (inch)

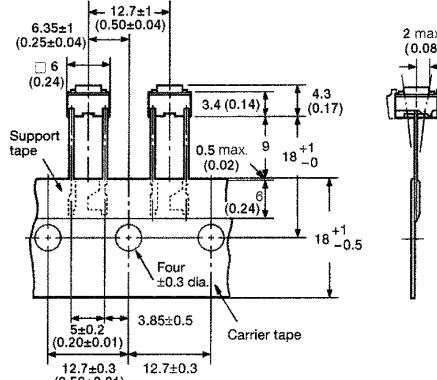
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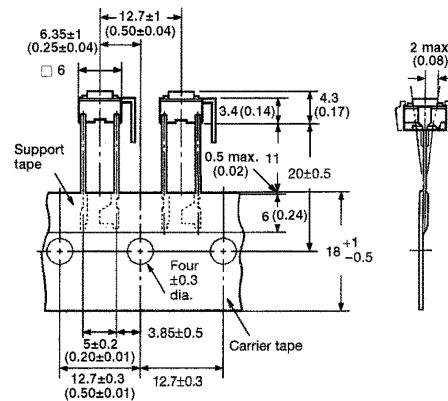
## ■ B3F-4150/-5150/-4155/-5151



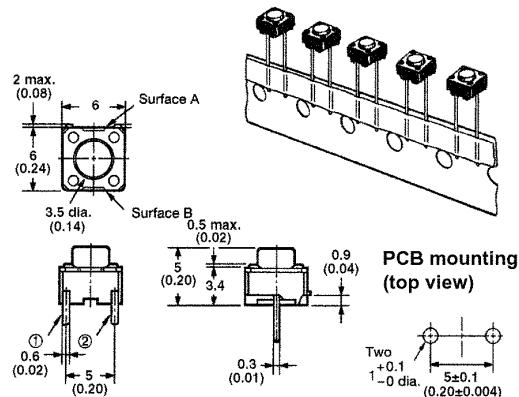
## ■ Tape-Packaging Dimensions



## ■ Tape-Packaging Dimensions

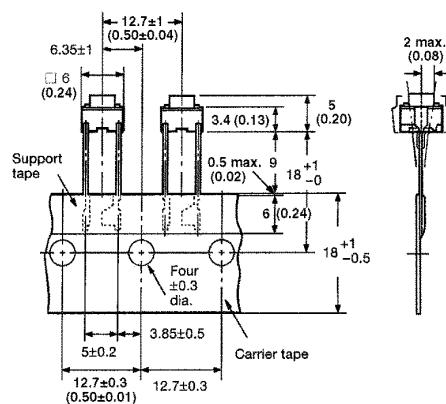


## ■ B3F-6020/-6022

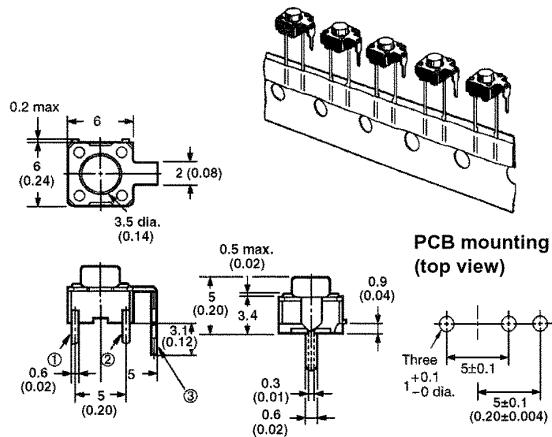


Terminal arrangement/  
internal connections  
(top view)

## ■ Tape-Packaging Dimensions

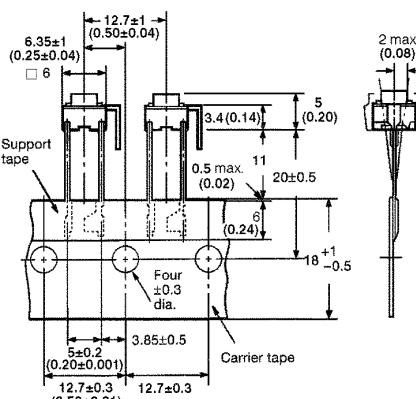


## ■ B3F-6120/-6122



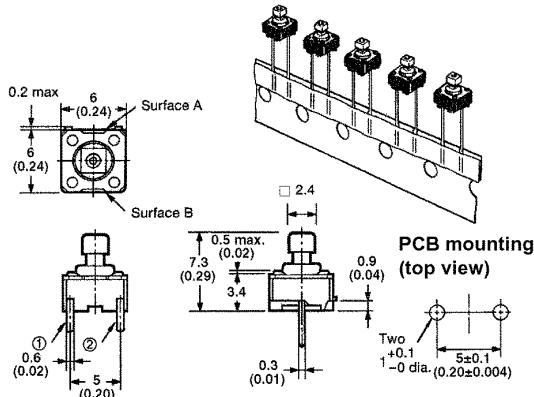
Terminal arrangement/  
internal connections  
(top view)

## ■ Tape-Packaging Dimensions



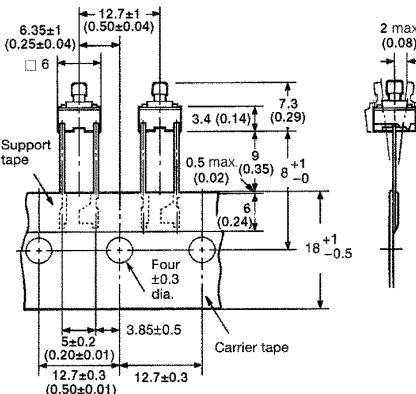
**Note:** Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## ■ B3F-6050/-6052

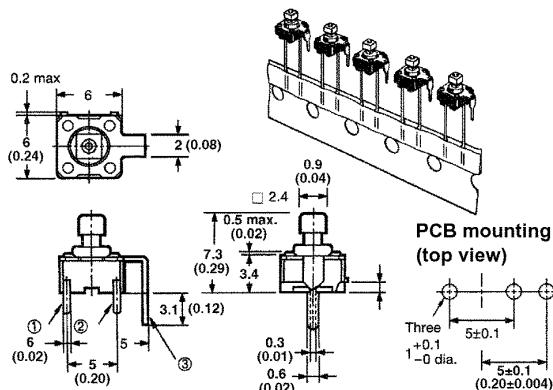


Terminal arrangement/  
internal connections  
(top view)

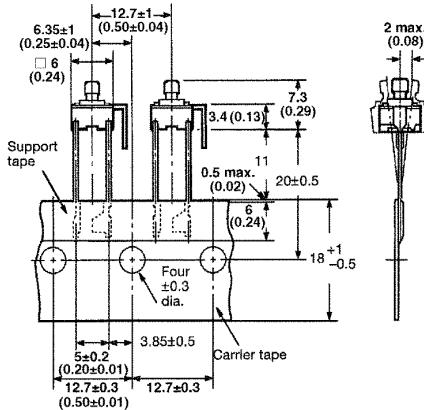
## ■ Tape-Packaging Dimensions



## ■ B3F-6150/-6152



## ■ Tape-Packaging Dimensions

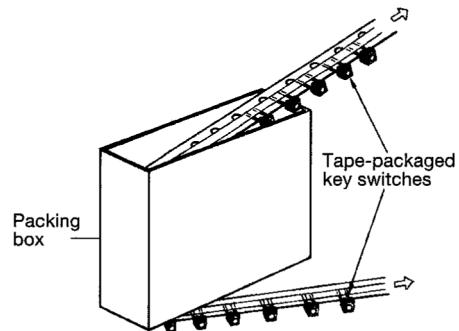
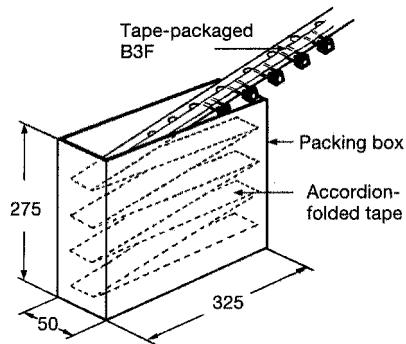


Note: Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## Hints on Correct Use

### ■ Taped Radial (Auto Insertion) Packaging

- Tactile switches packed on tape are placed into packing boxes as shown below.
- Number of switches per box: 1,000
- Tape may be drawn from the box either from the top or from the bottom.

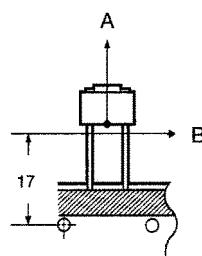


## ■ Taping Strength

The tactile switches will not release from the tape when pulled in directions A and B at the following forces.

A: 500 g

B: 100 g



# Terms and Conditions of Sale

1. **Offer; Acceptance.** These terms and conditions (these "Terms") are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronic Components LLC ("Seller"). Seller hereby objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
2. **Prices; Payment.** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. Payments for Products received are due net 30 days unless otherwise stated in the invoice.
3. **Discounts.** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Seller's payment terms and (ii) Buyer has no past due amounts owing to Seller.
4. **Currencies.** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller and which is available on the due date; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
5. **Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
6. **Taxes.** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
7. **Financial.** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
8. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
9. **Force Majeure.** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
10. **Shipping; Delivery.** Unless otherwise expressly agreed in writing by Seller:
  1. Shipments shall be by a carrier selected by Seller;
  2. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
  3. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  4. Delivery and shipping dates are estimates only.
  5. Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
11. **Claims.** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Seller within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Seller in the condition claimed.
12. **Warranties.** (a) **Exclusive Warranty.** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). Seller disclaims all other warranties, express or implied. (b) **Limitations.** SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Seller further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that in no event shall Seller be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Seller's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment. Seller shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies, or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing are not to be construed as an amendment or addition to the above warranty.
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15. **Property; Confidentiality.** The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
16. **Miscellaneous.** (a) **Waiver.** No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller. (b) **Assignment.** Buyer may not assign its rights hereunder without Seller's written consent. (c) **Law.** These Terms are governed by Illinois law (without regard to conflict of law principles). Federal and state courts in Illinois shall have exclusive jurisdiction for any dispute hereunder. (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Seller relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.. (g) **Definitions.** As used herein, "including" means "including without limitation".

# Certain Precautions on Specifications and Use

1. **Suitability for Use.** Seller shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in Buyer's application or use of the Product. At Buyer's request, Seller will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
  - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
  - (ii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - (iii) Use in consumer products or any use in significant quantities.
  - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.
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